Globalised labour markets?

International rent sharing across 47 countries*

Word count: 9739

Abstract

We present evidence about the role of rent sharing in fostering the interdependence of labour markets around the world. Our results draw on a firm-level panel of more than 2,000 multinationals and more than 5,000 of their affiliates, covering 47 home and host countries. We find considerable evidence that multinationals share profits internationally, by paying higher wages to their workers in foreign affiliates in periods of higher profits. This occurs even across continents, and not only within Europe, as shown in earlier research. The results are robust to different tests, including a falsification exercise based on 'matched' parents. Finally, we show that rent sharing is higher when the affiliate is located in a country with lower economic development and taxation. The differences between parents and affiliates tend to increase rent sharing while the number of affiliates tends to decrease rent sharing. We argue that these results are consistent with transfer pricing and bargaining views.

Keywords: Multinationals, Profit sharing, Wage determination

JEL Codes: J31, J41, J50.

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1 Introduction

Labour markets are influenced by a number of variables, some of which are determined abroad. Indeed, forces such as international trade have most likely played an important role in labour markets for many centuries. More recently, foreign investment - and multinationals - have become important drivers of labour market outcomes too, in particular as globalisation regained momentum in the last decade of the last century. This paper investigates one aspect of such international linkage of labour markets, namely the extent to which domestic wages are influenced by decisions taken by multinationals. In particular, we ask if multinational firms share rents across borders. This aspect not only sheds light on the general functioning of labour markets; it also studies another possible channel behind the transmission of business cycles across countries.

Most evidence on rent sharing - supranormal profits split between employers and employees - stems from within-country studies (Abowd & Lemieux 1993, Blanchflower et al. 1996, Van Reenen 1996, Arai 2003, Martins 2009, Dobbelaere & Mairesse 2010). These studies find without exception that industry or firm profitability increase workers' wages. However, a recent paper (Budd et al. 2005) presents evidence that rents are also shared by multinationals to their affiliates abroad. Based on firm-level data from European multinationals and their affiliates in Europe, they find significant elasticities of affiliate wages with respect to parents' profits of around 0.03, even after controlling for the profitability of the affiliate itself.[1], and the effect of affiliate wages with respect to its own profits is about 0.04.

Our paper makes three contributions to this small body of literature. First, we extend the analysis of Budd et al. (2005) to a much wider set of countries. In particular we consider a variety of multinational-affiliate relationships, drawing on an extended version of their data that covers 47 countries. We believe this is a more stringent test of international rent sharing than analyses across the North American border or within Europe, given the much greater heterogeneity in labour markets and other dimensions between, say, the U.S. and China than, say, between Germany and France. Second, we conduct a number of new robustness tests, including a falsification exercise that seeks to control for the role of common shocks affecting

[1] See also Budd & Slaughter (2004), which finds that the influence of U.S. industry profitability on Canadian union wages depends on whether the Canadian firms have parents in the U.S. In some other papers, the 'domestic', within-country rent sharing literature also exhibits an 'international flavour', namely when the exogenous variation used to identify the rent sharing effect comes from international variables, such as exchange rates and/or international trade (Abowd & Lemieux 1993, Martins 2009).

both the parent and its affiliate. Third, we investigate some of the possible determinants of the international rent sharing that we document, namely the role of different measures of the heterogeneity (or distance) between the parent and the affiliate.

Our results indicate that multinationals do share their profits with their affiliates abroad, even if the latter are located in a very different country. The wage elasticities we find are always precisely estimated and around 0.01 (from firm fixed effect estimation). In some cases, namely when using IV and GMM estimations, the elasticities are as large as 0.08, even if less precisely estimated. We also find that the elasticity of the affiliate wage to the parent profits is higher when affiliate is located in a country with low GDP and low taxation, and interpret them as the evidence of the transfer pricing. Further, the differences (i.e. cultural or production) between multinationals and their affiliates increase the magnitude of the rent sharing while the number of affiliates of a multinational has the opposite effect. We believe this is consistent with a bargaining interpretation of rent sharing but less so with fairness or risk sharing views. Indeed, the heterogeneity between parents and affiliates can be regarded as a proxy for the complementarity between parent and affiliate in terms of the global production process of the conglomerate; and such complementarity can be assumed to increase the bargaining power of affiliates.

The next section describes the data used, after which section 3 presents the main results. Sections 4 and 5 study the robustness of the main results and the relationship between the heterogeneity of locations and rent sharing, respectively. Finally, Section 6 concludes.

2 Data

Our analysis draws on Orbis, a data set with detailed accounting and financial information for the largest firms across the world. The data are collected and made available by Bureau van Dijck, an international consultancy firm. According to Bureau van Dijck, the information in Orbis is sourced from company reports collected by different providers, all of which are financial experts in their regions, providing detailed information, in particular about the company financial status.[2]

[2]Orbis also contains further detail such as news, market research, ratings and country reports, scanned reports, ownership and mergers and acquisitions data. There is also a large number of additional reports per company, in particular about banks, insurance and other listed companies, as well as other large private companies. On the other hand, there is unfortunately no information on workforce human capital. See Ribeiro et al. (2010) for more information on the Orbis data set and Bhaumik et al. (2010) and Yang & Martins (2010)

The records of each company include information on its subsidiaries or affiliates, defined as firms where the company has an ownership stake (corresponding to a minimum 25.01% shares control). These affiliates are identified by company name and country. We are therefore able to find matches between multinational parents and their matched foreign affiliates. As information on the link between the affiliate and the parent is only available for the last year in which the parent appears in the data, we assume that the two firms were linked during all years in which their information is available (Budd et al. (2005), who use the European version of these data, Amadeus, make the same assumption). Moreover, we consider firms that have information available on wage expenditure, profits, capital (tangible assets) and employment levels. Firms that report missing variables in at least one of these variables are dropped from our analysis. This criterion leads to the exclusion of several firms in some countries, in particular Canada, Mexico and India. However, this is not a relevant problem for the overwhelming majority of countries.

Firms that report negative net profits after taxes (4.9% of all observations) are dropped, as we adopt a log transformation in our analysis, as in Budd et al. (2005). We also drop firms with less than 50 employees and outliers in average wages and profits per worker.

Given the focus of the data on large companies, the data issues reported above, and the fact that the data are relatively expensive, we were not able to obtain information about all subsidiaries of all multinationals. However, we were still able to create a large data set, covering a total of 2,179 multinational parents and 5,230 of their foreign subsidiaries, over the period 1996 to 2007 (Budd et al. (2005) cover 865 multinationals and 1919 affiliates). A total of 3,274 out of our 5,230 affiliates are located in different continents than their parents.

2.1 Descriptive Statistics

Table 1 presents the key summary statistics, regarding the 21,840 parent-subsidiary-year observations in our data set (each observation corresponds to a unique parent-affiliate-year combination). As one would expect, we find that affiliates have much smaller average workforces (1,344 vs. 41,449 employees) and much smaller average levels of sales (€0.3 vs. €9.8 million). At the same time, these numbers indicate that our data set covers as many as 29 million workers-year in affiliate firms alone. On the other hand, average profits (net profits after taxes) per worker are similar in the two types of firms (€26,500 vs. €27,600) and average

for other papers that uses this data set.

capital per worker is even higher in affiliates than multinationals (€419,600 vs. €352,100), even if, of course, total profits and total capital are higher in multinationals, by virtue of their much larger size. Monetary values were converted into euros using exchange rates retrieved from the IMF.

In terms of the time coverage of the data, it is centered around 2002, with a small standard dispersion (2.7 years). Each parent-affiliate match appears on average 4.2 times (standard deviation of 2.6), which facilitates a longitudinal analysis and thereby controlling for time-invariant (observed and unobserved) heterogeneity.

Affiliate average wages are lower than parent average wages (€40,000 vs. €42,300). This comparison is possibly distorted by the large number of parents for which there is no data on average wages, even if this is not important in our main analysis as it does not require information on parent wages. However, when considering the subset of affiliates whose parents present wage information, the average wage is approximately €38,000, which is very similar to the previous number. As to the location variables, we find that, for instance, 22% of the parent-affiliate pairs operate in countries that have the same main language and 11% operate in the same two-digit industries.[3]

Appendix 9 presents the country distribution of firms, separately for multinational parents and overseas subsidiaries, along with the most important variables used in our analysis, including the average profit, capital and wage per worker. Our data cover 47 countries, including many OECD countries and also the largest developing nations - see Figure 1. Unsurprisingly, parents are concentrated in developed countries, with significant numbers in Belgium, Denmark, Finland, France, Germany, Italy, Japan, the Netherlands, Sweden, the U.K. and the U.S., which account for 83.3% of all parents. The majority of overseas subsidiaries are found in Belgium, the Czech Republic, Denmark, Finland, France, Germany, Italy, the Netherlands, Norway, Poland, Romania, Spain, Sweden and the U.K., which account for 88.8% of all overseas subsidiaries included in our data set. Unfortunately, overseas subsidiaries established in the U.S. do not include information on wages, and therefore cannot be included in our analysis, unlike U.S. multinationals.

To offer a better feel for the data, we present scatterplots of average wages and profits of

[3]If we were considering only parents and affiliates based in Europe, as in Budd et al. (2005), IPR of affiliate country are similar, economic development would fall from 26,572 to 25,201 and geographic distance would fall from 3,336 to 887 (standard deviations would also fall similarly). However, the same sector dummy would increase from 0.11 to 0.16.

affiliates and average profits of parents by affiliate country in Figure 2. The size of each circle is proportional to the number of affiliates or parents by country. The left panel indicates that higher affiliate profit is associated with larger affiliate average wage. On the other hand, the right panel (affiliate wages vs. parents profits) suggests that international rent sharing may also exist even if the relationship would be weaker than in the previous case.[4]

3 Results

Following Budd et al. (2005), we examine the relationship between affiliate wages and multinational profits by estimating the following equation:

$$Wage_{it}^{A} = \beta_1 Profit_{it}^{P} + \beta_2 X_{it} + \alpha_i + \gamma_t + e_{it}, \quad (1)$$

where the key variables are $Wage_{it}^{A}$, the logarithm of the average wage of affiliate i in year t, and $Profit_{it}^{P}$, the logarithm of the profit per worker of the parent of the same affiliate i in the same year t. The equation also includes other control variables (X_{it}), namely the profit per worker and capital per worker of affiliates and the capital per worker of parents (again all measured in logs), and different combinations of fixed effects, including industries (82) and countries, and year effects (γ_t), the latter controlling for business cycles and wage trends. Finally, the most detailed specifications also control for affiliate fixed effects (α_i). The key parameter is β_1, which indicates the elasticity of affiliate wages with respect to parent profits.

Table 2 reports our first set of estimates. Columns 1 to 3 exclude parents' characteristics (as in 'within-country' studies) while columns 4 to 6 consider parents' profits and capital level. $Profits^{p}$, $capital^{p}$, $profits^{A}$ and $capital^{A}$ are not highly correlated . The correlation matrix is available upon request. Columns 1 and 4 do not include any controls, while columns two and five control for affiliate country and industry (two-digit classification), and year effects. Finally, columns 3 and 6 control for affiliate fixed effects and year effects. From the first three columns, we find that affiliate profit and capital have the predicted positive effect upon affiliate wages. In particular, the affiliate profit result - elasticities between 3% and 4% - suggests that rent sharing also applies in subsidiaries of multinationals. This result is consistent with the literature that looks at samples of (domestic- and foreign-owned) firms in a given country

[4] A longer version of this paper includes additional graphical evidence on the relationship between profits and wages in our data.

(Abowd & Lemieux 1993, Blanchflower et al. 1996, Van Reenen 1996, Arai 2003, Martins 2009).

Turning to the last three columns of Table 2, we find that parent profits also have a positive and significant effect upon affiliate wages, even when already controlling for affiliate profits and capital (and parent capital). The elasticities range between 3% and 1% and are always precisely estimated. The latter, smaller estimate (1%) arises in the most demanding specification, which draws on the longitudinal variation of affiliate wages and parent profits, after controlling for year fixed effects (and longitudinal variation in parent capital and affiliate profits and capital).

While the affiliate fixed effects used above control for time-invariant heterogeneity, it remains possible that our estimates suffer from a simultaneity or endogeneity bias. For instance, parents and affiliates may suffer from demand shocks that occur at the same time and that could facilitate the misleading interpretation of an effect from parent profits to affiliate wages. Alternatively, our results may be underestimated because of measurement error in the profits variable. This would be particularly important if multinationals engage in transfer pricing, in order to shift profits to low-tax locations.

In order to solve or at least alleviate this issue, we draw on an instrumental variables approach, using lagged (first and second) values of parent profits to instrument for current-period parent profits. We therefore are assuming that lagged parent profits do not matter in terms of current affiliate wages (the exclusion restriction), while lagged parent profits will be correlated with current parent profits (our first stage). As before, we also control for firm fixed effects and other variables.

Table 3 reports the results, for different specifications, namely no controls (column 1), sector and year fixed effects (column 2) and affiliate and year fixed effects (column 3). The estimates of the wage-parent profit elasticities range between 5% and 8% (the upper bound arising in the most detailed specification) and are always significant, at least at the 10% level. The lagged profit per worker also displays a significant and positive effect, as expected. Moreover, the Sargan test of over-identification indicates that the instruments are valid. In column four we used first differences of parent profits (current and first lag periods) to instrument for current period parent profits[5], and we again find the evidence that parents share profits

[5]We also use one and two lagged of first differences of parents' profits as instruments, and the results are robust.

internationally, which is significant at 10% level. In each IV estimation, the Sargan test of over-identification and tests of weak-identification and under-identification indicate that the instruments are valid.

One could argue that our sample of affiliates and parents is not representative of the country distribution of foreign direct investment in the world and this could distort our findings. To shed light on this matter, we rerun the models of Table 2 but now weighting each observation using alternately the levels of FDI of the parent country or of the host country (using data from UNCTAD). This concern does not appear to be relevant given that the new estimates - presented in Appendix 10 - are very similar. In particular, the most detailed specification (column 6) again indicates elasticities of around 1%.

We also tested the robustness of these IV results to the consideration of host or home country FDI weights and we found no qualitative differences. The same applies to specifications ignoring parent or affiliate capital or affiliate profits. In terms of our OLS results, we also found that the results are robust to a log-level specification, that does not force us to drop observations with negative profits. We also compared the rent sharing estimates between manufacturing and services and found very similar results in the two cases. When comparing the estimates between developed countries and from developed to developing economies, we found that the latter point estimates tend to be larger, a result that we address in more detail in Section 5. All these additional findings are available upon request.[6] We further test the robustness of our results by using first differencing and GMM estimators (Arellano and Bond, blunder and bond), and report the results in table 4. However, linkage data employed in this paper have gaps during the period, resulting a substantial drop of observations in these alternative estimation techniques. We again find the evidence that parents share profits internationally. We also report the serial correlation tests AR(1) and AR(2) in this table. P values of Sargan test and AR(2) statistic value are both insignificant, suggesting that the GMM estimation model is correctly specified and instruments are valid.

A useful measure of the economic effect of international rent sharing is the Lester range (Lester 1952). This is defined as the wage increase of a worker that would move from a 'low-rent' firm to a 'high-rent firm', while everything else were constant, in which 'low (high)

[6]We are also currently working on a companion paper where we draw on matched employer-employee panel data for one of the countries considered in the study which we then also match to information about the parent's profitability. This exercise allows one to consider human capital differences in much greater detail, including sources of heterogeneity such as worker-level time-invariant heterogeneity and firm-worker match effects. However, this comes at the expense of international generality.

rent' is defined as the rent level two standard deviations below (above) the mean. Focusing on the last three columns of Table 2, we find Lester ranges of 7% (in our firm fixed effects specification) to 19% (corresponding to column 4). When considering instead the IV and GMM estimates from Tables 3 and 4, Lester ranges 9% to 51%. On average, the Lester range in IV and GMM approach estimations is approximately 32%. This also similar to the equivalent results obtained in Budd et al. (2005), which reports a central Lester range of 36%, and fits to the general range of Lester range found in the rent sharing literature, which is centred at 27%, ranging from 10% in Card et al. (2010) to 56% in Monteiro & Portela (2011) and Martins (2009).

We further conduct a number of additional tests, which are reported in Table 5. First of all, we consider the degree of ownership stake of the parent in its affiliate, namely wholly (98% - 100% shares), majority (50% - 97% shares) and minority (25% - 49% shares) owned by the controlling parent. We therefore split samples into three groups: the wholly owned affiliates (column 1), the majority owned affiliates (column 2), and the minority owned affiliates (column 3). We find that international rent sharing is mainly in the subsample of affiliates who are fully owned by multinational parents. This suggests that the rent sharing effect is lower for multi-parent affiliates, compared with one-parent affiliate. This result is similar to the findings in Budd et al. (2005), which reports that rent sharing is higher for the wholly owned affiliates. Next, we re-estimate Eq. 1using profits before tax, instead of profits after tax. We report the result in column 4, However, while this variable is not available for the full sample of firms, they are just available for over half. Using net profit before taxes substantially reduces our sample size, but we again find that multinationals share profits internationally.

Further, we re-estimate the international rent sharing effect, by including a set of control variables including cash flows, intangibles, long term debt and sales of the affiliate. However, while these are not available for the full sample of firms, they are just available for over half. Inclusion of these variables substantially reduces our sample size, but we again find international rent sharing evidence (reported in column 5). In order to rule out the possibility of multicollinearity between capital and profits, we include profits alone in column 6, and the rent sharing effects are again evidenced. The rent sharing results are also robust when we use one lag of profits in column 7. Finally, as described in the summary statistics section, parents that report negative profits (4.9% of all observations from 406 firms) are dropped, as we adopt

a log transformation of profits in our analysis, as in Budd et al., (2005). We include firms who report negative profits, and re-ran the estimation using levels instead of a log transformation of variables, and report estimates in column 8 of table 5. We find that parents share profits internationally. Further, we examine the rent sharing evidence for a subsample of firms who report negative values, while the effect became insignificant (reported in column 9 of table 5).

4 Further robustness

4.1 Affiliate-to-parent rent sharing?

Our first robustness test involves examining if there are rent-sharing effects when considering again the relationship between parents and affiliates but from the opposite direction, i.e. if affiliates share rents with parents' employees. Given the much larger size of multinational parents when compared to affiliates (as indicated in Section 2.1), we would find it surprising if such affiliate-to-parent rent sharing also occurred. Furthermore, such a result could cast doubts on our interpretation of the main results, as it could suggest that the parent-to-affiliate rent sharing arose out of common shocks to the two firms rather than a genuine outcome of bargaining or risk-sharing mechanisms.

We test this hypothesis drawing on a modified version of equation 2:

$$Wage_{it}^{P} = \beta_1 Profit_{it}^{A} + \lambda X_{it} + \alpha_i + \gamma_t + e_{it}, \tag{2}$$

where $Wage_{it}^{P}$ is the log of the average wage of multinational parent i in year t and $Profit_{it}^{A}$ refers to the log of the profit of the affiliate over the same period. The equation also includes other control variables, including the profit and the capital of the parent and the capital of affiliate (X_{it}), parent industry, country or firm fixed effects (α_i) and year effects (γ_t). The key parameter is β_1, which indicates the elasticity of parent wages to affiliate profits.

Table 6 presents the results, following a similar structure to Table 2. Columns 1 to 3, which ignore affiliate variables, indicate that rent sharing is present at the multinational (parent) level - a result that is similar to the one obtained when considering the role of affiliate profits on affiliate wages. On the other hand, the symmetry with previous findings is shown to come to an end when we consider the role of affiliate profits on parent wages (columns 4 to 6): except for the simplest specification (column 4), the other results indicate no significant evidence of

rent sharing from affiliates to their parents. Estimates from OLS estimation produce biased results, compared with the most detailed specification of firm fixed effect estimation (column 6), because OLS estimation does not control for the firm invariant factors. Therefore, our main focus in Table 6 is estimates from firm fixed effect regressions. As before, we find that these results are robust (i.e. still insignificant) to different weightings. One may argue that columns 1 to 6 results gave more weight to multi-affiliate parents. In order to avoid to give more weight to multi-affiliate parents, we re-estimate the rent sharing effect by adding the weight that is inversely proportional to the number of affiliates for each parent. Further, we average the total profits and capital of the affiliates who share the same parent, and re-ran our estimation. We still find results are robust, and there is no evidence of rent sharing from affiliates to their parents. We report these results in columns 7-8 of Table 6.

We also conducted another test following a similar approach, in which we examine the relationship between the employment levels of affiliates and the profits of their parents. If increasing parents' profits lead to the expansion of the size of the affiliates, then the average affiliate wage could increase if marginal workers demand higher individual wages, and not because of rent sharing. However, we could not find any systematic link between parent's profits and affiliate size. These results are available upon request.

4.2 Falsification test

As mentioned before, one concern about our preferred interpretation of the international rent sharing results is that it may arise out of shocks that simultaneously hit the profitability of parents and the wage levels of affiliates. For instance, a worldwide increase in the demand for a given product could presumably raise the profits of a multinational that operates in that industry while, at the same time, that shock will also raise the labour demand - and therefore the wages - of workers of an affiliate of that same multinational based in a different country. Even if this alternative explanation is less likely to apply in the context of our more diverse set of multinationals and affiliates, compared to Budd et al. (2005), this correlation could be strong enough to survive the controls we consider, leading us to incorrectly interpret our results as rent sharing.

In order to provide additional evidence on this issue, on top of the IV and affiliate-to-parent analyses presented before, here we conduct the following falsification test: we match

parents to other parents that are very similar in a number of characteristics (as available in our data set), in the spirit of a propensity score matching analysis (Rosenbaum & Rubin 1983). Furthermore, we also require that each parent and its match (another parent) are located in the same industry and in the same country (i.e. we exact match on these two variables).[7] We then take the profit information of this 'matched parent' and use that in the regression in the place of the profit information of the true parent. Finally, we rerun our previous estimations, based again on the benchmark specification of equation 1.

The idea is to select information from parent firms that are very similar and therefore would be subject to the same shocks as the matched counterpart. If this exercise results in similar or at least significant estimates of 'rent sharing', then we would have to at least revisit our interpretation of our previous estimates (such as those of Table 2). On the other hand, if this exercise results in insignificant estimates, then that would be consistent with our preferred interpretation of rent sharing.

The range of variables initially available for the matching exercise is reasonably large (employment, sales, capital, age, number of affiliates, year), and certainly at least comparable to ranges adopted in other empirical papers. In any case, we also consider several transformations of these variables (squares, cubes, interactions of two and three variables) in order to obtain a more precise correspondence between the two matched parents, at least along observable dimensions, in the spirit of a propensity score matching exercise. As mentioned above, we also require that, for each affiliate, the matched parent is in the same industry and country as the original, true parent. To provide more robustness, we also obtain results when we match on the parents' profits on top of the remaining variables.

As to the matching process itself, we start by pooling all parents and affiliates and then estimate a logit model where the dependent variable is a parent dummy and the regressors are the variables and polynomials described above. Using these coefficients, we compute the probability that each parent is in fact a parent (the alternative being an affiliate). In the last step of this analysis, we find which parent is the best match for each other parent by comparing their probabilities of 'parenthood', as in the nearest neighbour algorithm.

Appendix 11 presents descriptive statistics on the quality of the match obtained. These variables are measured in ratios as those of the employment flows literature, which are bound between -2 and +2 (i.e. we divide the difference of the two figures by the mean of the same

[7] Ideally, we would be matching Coca-cola and Pepsi or HP and Dell, for instance.

two figures). The results indicate a very good quality in the matching, as the average ratios are always low - even if the standard deviations are relatively high. Furthermore, we find that matching also on profits does not change the results, in particular it does not lead to a sizable deterioration of the quality of matching, which is further evidence that our matched parents are similar to the original parents. The absence of major differences to the quality of matching when profits are added is driven by the very large number of variables used in the matching process (more than 60 variables).

The regression results - presented in Table 7 - are again based on different versions of equation 1. Moreover, the first set of estimates (columns 1 to 3) weights each observation inversely to the absolute difference in the propensity score of the parent and its match. In other words, these results attach greater importance to parents that are better matched. The top panel, where profits are ignored as a matching variable, indicate evidence of spurious rent sharing only when not controlling for any covariates (columns 1 and 4). In the remaining columns, all 'parent' profits estimates are insignificant. Some point estimates are even negative. The bottom panel exhibits greater resilience of the spurious rent sharing effects, as expected: even the columns with industry and country fixed effects return significantly positive coefficients. However, when adding affiliate fixed effects (columns 3 and 6), the coefficients again lose significance and the point estimates are virtually zero. Furthermore, we require each match to be in the same year and same three digit sector (column 7)[8], and use three nearest neighbour to find matches (column8), instead of one nearest neighbour. The results are robust (still insignificant). We require the matches to be in the same year and the same 3-digit sector, and we find the results are robust. Further, results are again robust when matches are found by the three-nearest neighbours. We report them in columns 7 and 8 of table 7. Using three-nearest neighbour method, in column 8 we find that the number of matches is the same in panels A and B. We take the results from this novel test as important evidence against a spurious relationship between parent profits and affiliate wages and in a favour of a causal interpretation of our findings.

[8]We further require each match to be in the same four digit sector, and the results are robust.

5 Extensions

Having provided considerable evidence of a causal interpretation of our estimates, we now turn to the fit between our results and the theoretical motivation presented above, which was based on transfer pricing, bargaining and risk sharing mechanisms. We test this fit by making the argument that, if the rent sharing effect is higher when the affiliate is located in a country with low economic development, low taxation, low IPR and technological capability. We also argue that bargaining and/or risk sharing do in fact drive the rent sharing results presented in the paper, then the differences between the parent and the affiliate may be an important parameter affecting the magnitude of the effect. For instance, if the parent and the affiliate are located in nearby or even adjacent countries, then it is less likely that they will be subject to different shocks that would warrant a risk sharing mechanism. Furthermore, if the parent and affiliate are located far away from each other, then it may be more likely that the type of foreign investment that occurred there is of a vertical nature (Carr et al. 2001), if the multinational is slicing its production chain to explore the location advantages of the affiliate country. In that case, this will have implications in terms of a stronger bargaining power of the affiliate, as the scope of hold-up and of disruption of the international production flow would increase. However, in the case of horizontal investment, a threat by an affiliate to stop or disrupt production would have much smaller knock-on consequences in terms of the multinational production process, even in a period of increasing profits, given its weaker complementarity with the parent. In this case, the scope for wage increases would be small.

These mechanisms are also consistent with evidence that multinationals take into account local market conditions when setting up foreign operations, for instance by focusing affiliates on processing imported inputs (vertical investment) in countries with lower wages and trade costs and smaller markets (Hanson et al. 2005). As the latter type of countries will be found mostly in developing countries, while multinationals typically have their headquarters in developed economies, then, if rent sharing is relevant, the wages of affiliates in developing countries will be more closely tied to the circumstances of headquarters than the wages of affiliates in developed economies. This may be particularly important in a context of contract incompleteness (Ottaviano & Turrini 2007).

In our empirical analysis of this issue, we take a broad approach to the concept of affiliate locational factors. In particular, we consider economic, technological, IPR taxation, trade

unions density measures. We consider linguistic and geographical distance between the affiliate and parent. We also consider a variable that seeks to capture the complementarity of the two types of firms more directly - a dummy variable equal to one if the two firms operate in the same industry. However, even such a measure does not capture the concept that we are examining, as differences within a two-digit industry classification may already be enough to generate important complementarity issues.

More specifically, the list of location variables that we use in this extension is as follows:

1. Economic development: the GDP per capita of the country where the affiliate is located, using GDP data from the World Development Indicators (World Bank 2011).

2. Intellectual property rights (IPR): the Park (2008) IPR index for affiliate country. Given the data available (2000 and 2005 only), we use the 2000 IPR index for the years corresponding to 1997-2000 and the 2005 IPR index for the years corresponding to 2001-2007.

3. Technology: difference in the share of resident patent applications in the total number of applications, as available from the World Bank indicators, given that patent data are often used as a measure of technological capability (Griliches 1990).

4. Taxation: the taxation level on income, profits and capital gains (% of revenue) of the country where the affiliate is located, using the from the World Development Indicators (World Bank 2011).

5. Trade union density: the level of trade union density of the country where the affiliate is located, using trade union density data from the OECD (2013).

6. Language: dummy variable equal to one if the two countries have the same official language and zero otherwise.

7. Geography: distance (log kilometres) between the capital cities of parent and affiliate country, following the 'great circle formula', as available from the CEPII Distances dataset.

8. Industry: dummy variable equal to one, if the two firms are in the same two-digit industry, or zero, otherwise.

We estimate the effects of location of the affiliate on rent sharing by adding each variable and its interaction with the affiliate profits variable in equation 3:

$$Wage_{it}^{A} = \beta_1 Profit_{it}^{P} + \beta_2 Location_{it} + \beta_3 Profit_{it}^{P} * Location_{it} + \lambda X_{it} + \alpha_i + \gamma_t + e_{it}, \quad (3)$$

All variables have the same interpretation as before, while $Location_{it}$ corresponds to each one of the six heterogeneity variables we consider and $Profit_{it}^{P} * Location_{it}$ is the interaction term of interest. However, in order to compare the effects of each heterogeneity variable, we standardise them. Specifically, we subtract the mean of the variable across all observations used and then divide that difference by the standard deviation of the variable again obtained across all observations considered.

The results[9] are presented in Tables 8. First of all, we find that the locational variables have the predicted effect on affiliate wages. Regardless of the table, affiliate wages are higher when affiliates are in high IPR, technology, economic development, taxation country. The same applies to language (positive coefficient if the language is the same), while the 'same sector' status is associated with smaller average wages. Turning now to the key results, those of the interaction terms, three of the five coefficients are significant in columns 1-5 of while three are significant in column 6-8 of Table 8. We find that the elasticity of the affiliate wage to the parent profits is higher when the affiliate is located in a country with lower GDP and low taxation, and interpret them as the evidence of transfer pricing. Further, we also find the trade unions density increases the rent sharing effect.

Next, we examine the role of bargaining and the risk sharing on the international rent sharing in columns 6-10. Rent sharing is weaker between firms in countries that share the same language. The magnitude of the effects is also similar across measures.[10]. The only exception in columns 6-10 to this pattern concerns geographic distance, whose coefficient is insignificant in both tables. This result is consistent with one of the robustness tests presented in Budd et al. (2005), who also interacted profits with geographic distance. They justify this analysis arguing that rent sharing could be determined by information flows, and the latter could be proxied by physical location. However, they found "no substantial variation in profit

[9]Results based on weights by parent country FDI and host country FDI are very similar and available upon request.

[10]We also found that rent sharing increases with the difference in the level of 'intangible capital' between the parent and the affiliate. However, we have not been able to obtain a good definition of the measurement of such capital in our data.

sharing from distance" (p. 81). In our view, one could argue instead that geographic distance is a poor proxy for the idea of complementarity between locations as a determinant of rent sharing that motivates our analysis.

Overall, these results may also be consistent with recent findings based on matched firm-worker longitudinal data that the wage premium of foreign-owned firms with respect to domestic firms is decreasing in the level of development of the host country (Hijzen et al. 2010).[11] If foreign-owned firms in developing countries benefit from high levels of rent sharing (as predicted from our distance results), then rent sharing would create a wedge, on average, between the pay levels of the two types of firms. This would still be the case even if base wages were initially set at similar levels to those of domestic firms in those countries. A similar wedge would not arise, at least not to the same extent, between domestic and foreign firms in developed countries given the smaller levels of heterogeneity, on average, with respect to the parent countries of the latter.

We investigate a little deeper the bargaining interpretation of our results by considering a new interaction: the number of affiliates of each parent. The motivation is that, if a parent has many affiliates, it will be more difficult for any one of them to extract wage concessions from the parent through rent sharing. All being the same, an affiliate of a parent company with a large total number of affiliates would have weaker bargaining power as it would not be able to threaten to disrupt the operation of the parent to the same extent as an affiliate of a smaller parent (with fewer affiliates). In the former case, a multinational could relocate production across the world ('footloose multinationals') and even play affiliates one against the other.

In terms of the descriptive statistics, we do find considerable levels and dispersion of the number of parent affiliates across affiliates: 196 on average and a standard deviation of 191 (see Table 1). These numbers are quite large as they draw together home and overseas affiliates, including foreign affiliates not picked up in our data set but that are owned by a parent. The statistics are also computed across affiliates, which will give greater weight to large parents. Moreover, the results in Tables 8 indicate clearly that rent sharing falls with the number of affiliates: the point estimates of the interaction coefficients are -0.011 (columns 9). Finally, we find the rent sharing effect is greater when affiliates are larger, We find that the rent sharing

[11] In current work in progress, we also find considerable evidence, drawing on a similar data set to the one used in this paper, of a negative relationship between economic development and wage differentials between domestic and foreign firms (Martins & Yang 2011).

is greater when the affiliate represents a larger share in its parents employees, measured by the ratio of number of employees in the affiliate to total employees of its parent. We take these results as additional evidence that bargaining mechanisms drive the rent sharing effects that we document, rather than risk sharing of fairness considerations.[12]

6 Conclusions

The paper examined the extent to which multinationals share their rents across affiliates located abroad in terms of higher affiliate wages, considering a wide variety of home and host countries. This is an important question to understand the sensitivity of domestic labour markets to economic conditions abroad and the mechanisms behind the international transmission of shocks. Until now, this issue had been examined only in Budd et al. (2005), who draw on 1990s data of multinationals and affiliates based in Europe.

Here we draw on firm-level panel data that is similar to the one used in that paper except that it covers a larger and more heterogeneous range of parent-affiliate pairs. Many of these parent-affiliate pairs are located in different continents and in very different country settings, along several dimensions. We can therefore not only assess the generality of the international rent-sharing phenomenon but also understand some of its determinants, namely in terms of the contrast between the locations of the parent and affiliate firms, with a view to clarifying its theoretical mechanisms.

First, we find that the earlier results for multinationals and affiliates both located in Europe (Budd et al. 2005) also hold when considering a wide set of both parent and affiliate locations. We obtained elasticities of average affiliate wages with respect to parent profits of 1% to 8%, the latter case when considering instrumental variables.

Second, we obtain evidence that such a positive relationship is particularly robust and consistent with a causal interpretation. For instance, affiliate profits do not seem to affect parent wages. This is as one would expect given the smaller size of affiliates - but not necessarily if a third, unobservable variable were driving both profits and wages of the two types of firms, such as common shocks to parents' profits and affiliate's wages. More important, our falsification exercise, based on considering the profits of similar parents, resulted in insignificant

[12]We also discussed this paper with two senior human resource managers from two large multinationals (based in the consultancy and pharmaceuticals sectors), who find our results and the bargaining interpretation consistent with their personal experiences.

estimates.

Third, when examining the determinants of international rent sharing, we find that location (regardless of its specific definition - economic, cultural, technological, trade unions density, and taxation) tends to influence rent-sharing effects. On the other hand, the number of affiliates reduced rent sharing. We argue that this result supports the view that rent sharing is driven by bargaining considerations. Indeed, such heterogeneity can be regarded as a proxy for complementarities in production (vertical foreign investment), which would create bargaining opportunities.

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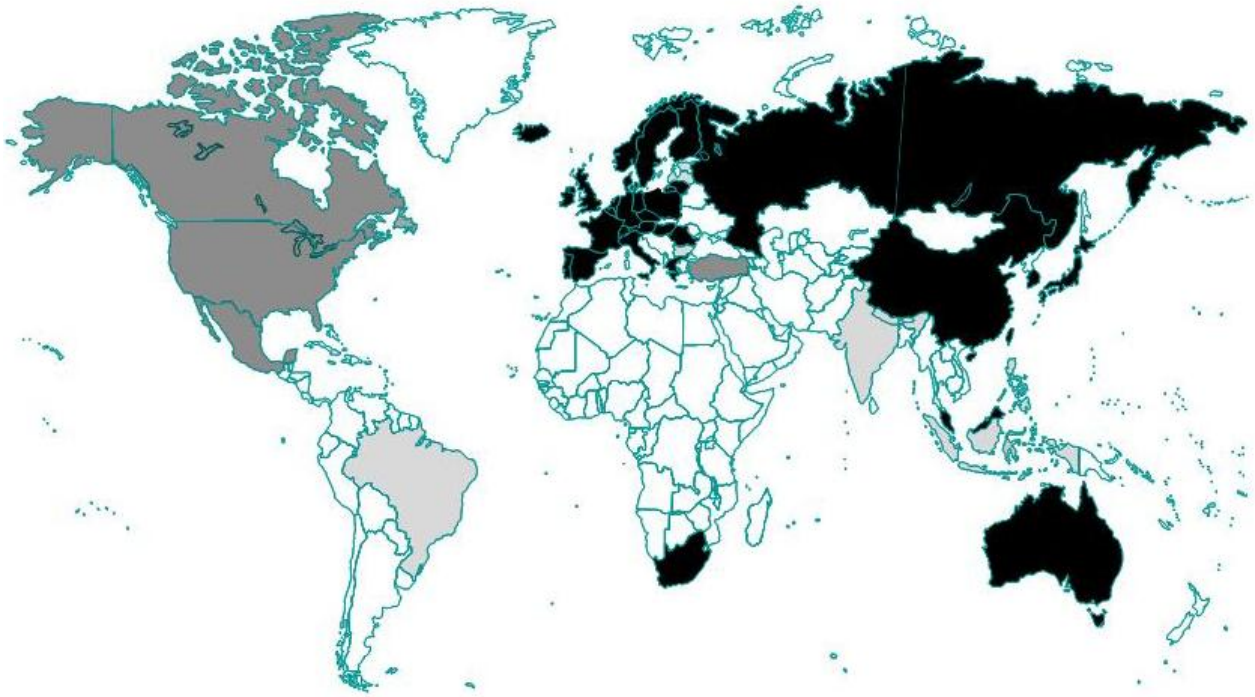
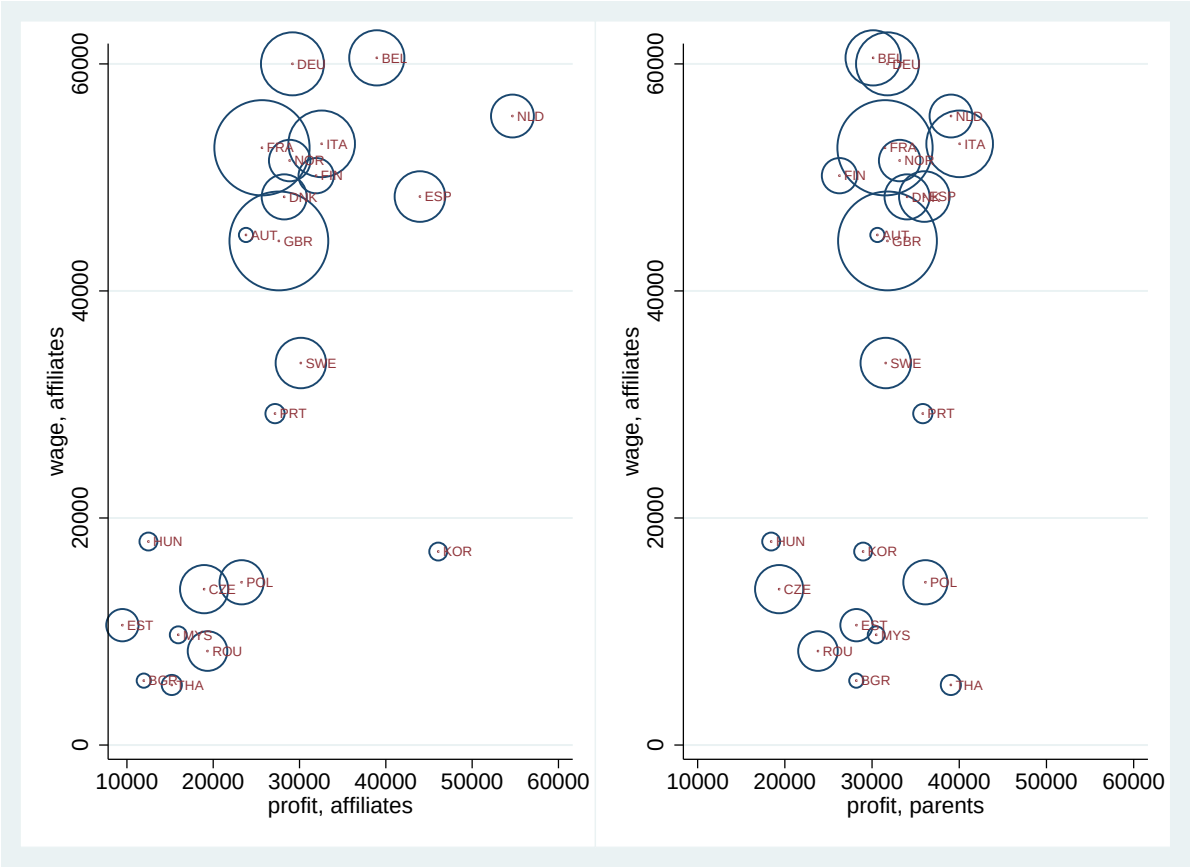
Figures

Figure 1: Country coverage



Notes: There are four groups of countries, depending on the type of information available in our data set: countries for which we have both parent and affiliate information (in black), only parent information (dark grey), only affiliate information (light grey), no information (white). The first three categories include 47 countries.

Figure 2: Average wages and profits of affiliates and average profits of parents, by country



Notes: The left figure is the relationship between affiliate profit (average) and affiliate wage (average), by country in the year of 2005. Countries with more than 10 firms are left in this figure. The right figure is the relationship between parent profit (average) and affiliate wage (average), by country. Size of circle is proportional to the weight of GDP per capita of 2005 by country. Weight is used from world development indicator. The label in the circle is the country ISO code. Countries included in this figure are Australia (AUS), Austria (AUT), Belgium (BEL), Bulgaria (BGR), Brazil (BRA), Switzerland (CHE), China (CHN), the Czech Republic (CZE), Germany (DEU), Denmark (DNK), Spain (ESP), Estonia (EST), Finland (FIN), France (FRA), the U.K. (GBR), Greece (GRC), Hong Kong (HKG), Hungary (HUN), Indonesia (IDN), Indian (IND), Ireland (IRL), Iceland (ISL), Italy (ITA), Japan (JPN), South Korea (KOR), Liechtenstein (LIE), Lithuania (LTU), Luxembourg (LUX), Latvia (LVA), Malaysia (MYS), the Netherlands (NLD), Norway (NOR), Philippines (PHL), Poland (POL), Portugal (PRT), Romania (ROU), Russia (RUS), Singapore (SGP), Slovenia (SVN), Sweden (SWE), Thailand (THA), Taiwan (TWN), and South Africa (ZAF). Taiwan is not included in the figure as GDP per capita is not available from world development indicator.

Tables

Table 1: Descriptive statistics

		Variable	Mean	Std. Dev.	Obs
Firm characteristics					
	Affiliates				
		Average wage per worker	40.0	20.6	21840
		Profit per worker	26.5	41.1	21840
		Capital per worker	419.6	13487.6	21840
		Employment	1344.8	4788.7	21840
		Turnover	347337.9	1006446	21821
	Parents				
		Average wage per worker	42.3	32.9	12612
		Profit per worker	27.6	42.8	21840
		Capital per worker	352.1	804.4	21840
		Employment	41449.3	69625.7	21840
		Turnover	9826596	2.19e+07	21838
		Survey Year	2002.3	2.7	21840
Location variables					
		IPR	4.51	0.26	21307
		Technology capability	0.66	0.22	12173
		Economic development	26572.75	11323.90	21697
		Tax rate	27.96	8.59	21061
		Trade Unions Density	30.58	20.04	20809
		Common language	0.22	0.41	21697
		Geographic	3336.27	3320.18	21697
		Same sector	0.11	0.31	21840
		Number of affiliates	159.15	180.72	21840
		Employees ratio (affiliate/parent)	0.47	5.407911	21840

Notes: All monetary variables are in thousands of euros. 'Profit per worker, parents (affiliates)' is profit per worker of the multinational parents (affiliates). 'Capital per worker, parents (affiliates)' is capital per worker of the multinational parents (affiliates). 'Employment, parents (affiliates)' is number of employees of multinational parents (affiliates). 'Sales, parents (affiliates)' is total sales of the multinational parents (affiliates). 'Average wage, parents (affiliates)' is average wage per worker of the multinational parents (affiliates). 'IPR' is the IPR index in Park (2008) of the affiliate country. 'Technology capability' is the technology capability of the affiliate country (share of resident patent applications in the total number of applications.). 'Economic development' is the GDP per capita of the affiliate country. 'Taxation' is the taxation level on profit, income and revenue of country where the affiliate is located, using the taxation data from the World Development Indicators (World Bank 2011). 'Trade union' is the level of trade unions density of the country where the affiliate is located, using trade union density data from OECD (2013). 'Same language' is equal to one if the parent and affiliate country have common official of primary language, otherwise is zero. 'Geographic distance' is simple distance between capitals of the parent and affiliate country. 'Same sector' if the firms operate in the same two-digit industry. 'Employees ratio (affiliate/parent) is the ratio of number of employees in the affiliate to total employees of its parent.

Table 2: Main rent sharing results

	(1)	(2)	(3)	(4)	(5)	(6)
Profit, parents				.030***	.016***	.011***
				(.005)	(.003)	(.003)
Capital, parents				-.089***	.012***	.091***
				(.007)	(.004)	(.009)
Profit, affiliates	.027***	.041***	.035***	.024***	.039***	.034***
	(.004)	(.003)	(.003)	(.004)	(.003)	(.003)
Capital, affiliates	.405***	.177***	.308***	.429***	.171***	.292***
	(.007)	(.005)	(.012)	(.007)	(.005)	(.012)
Obs.	21840	21840	21840	21840	21840	21840
F statistic	2933.652	246.219	533.601	1501.145	245.621	352.496
R^2	.352	.783	.939	.358	.784	.94

Notes: Dependent variable: log average wage per worker of multinational affiliates. All explanatory variables are in logs. Columns 2 and 5 include country, sector and year effects, while columns 3 and 6 include affiliate firm fixed effects and year fixed effects. 'Profit, affiliates (parents)' is profit per worker of the multinational affiliates (parents). 'Capital, affiliates (parents)' is capital per worker of the multinational affiliates (parents). Values in parentheses are standard errors. Robust standard errors. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 3: Rent sharing: IV estimates

	(1)	(2)	(3)	(4)
Profit, parent	.078***	.053***	.083*	.014*
	(.010)	(.007)	(.049)	(.007)
Capital, parent	-.096***	-.012*	-.083**	.074***
	(.011)	(.007)	(.038)	(.016)
Profit, affiliate	.012**	.041***	.027***	.038***
	(.006)	(.004)	(.006)	(.006)
Capital, affiliate	.383***	.187***	.280***	.335***
	(.007)	(.005)	(.035)	(.033)
Obs.	10819	10819	9956	9560
F statistic	1572.406	266.736	185.254	93.753
R^2	.368	.755	.351	.313
First-stage results				
Profit per worker, parents (1st lag)	.569***	.550***	.133***	
	(.009)	(.009)	(.024)	
Profit per worker, parents (2nd lag)	.120***	.122***	-.088***	
	(.009)	(.009)	(.021)	
First differences of parents' profits				.613***
				(.011)
First differences of parents' profits (1st lag)				.360***
				(.010)
Underidentification test	4855.479	4612.295	37.044	723.901
Chi-sq(2) P-val	0.000	0.000	0.000	0.000
Weak identification test	4401.955	3973.064	21.722	1626.772
Stock-Yogo 10% maximal IV size	19.93	19.93	19.93	19.93
Hansen J statistic	1.714	.001	.379	.03
Chi-sq(1) p-value	.19	.974	.538	.863

Notes: Dependent variable: log wage per worker of affiliate. All explanatory variables are in logarithms. Values in parentheses are robust standard errors. 'Profit, parents' is profit per worker of the multinational parents. 'Capital, parents' is capital per worker of the multinational parents. 'Profit, affiliates' is profit per worker of the multinational affiliates. 'Capital, affiliates' is capital per worker of the multinational affiliates. 'L. Profit, parent', 'L2. Profit, parent' 'First differences of parents profits', and 'L. first differences of parents profits' are used as instruments for current-period parent profit. 'L. Profit, parents' is profit per worker of the multinational parents at one year before, and 'L2. Profit, parents' refers to profit per worker of the multinational parents at two years before. 'First differences of parents profits' is the first difference of profit per worker of the multinational parents, and 'First differences of parents profits' is the first difference of profit per worker of the multinational parents at one year before. Column 1 does not control for any fixed effect, and column 2 controls for country, sector and year fixed effects. and columns 3 and 4 controls for affiliate firm fixed effect and year fixed effect. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 4: Rent results - Year fist-differencing and GMM

	(FD)	(GMM-AB)	(GMM-BB)
Profit, parents	.005*	.018***	.015***
	(.003)	(.006)	(.003)
Capital, parents	-.040***	.078***	-.026***
	(.008)	(.020)	(.006)
Profit, affiliates	.012***	.041***	.007**
	(.002)	(.005)	(.003)
Capital, affiliates	.218***	.523***	.107***
	(.009)	(.021)	(.012)
Obs.	12859	9111	9111
AR (1)		-6.5708	-4.01
AR (1)-P value		0.0000	0.000
AR (2)		1.2629	1.02
AR (2)-P value		0.2066	0.308
Sargan test (P value)		0.5067	0.422

Notes: Dependent variable: log average wage per worker of multinational affiliates. All explanatory variables are in logs. 'Profit, affiliates (parents)' is profit per worker of the multinational affiliates (parents). 'Capital, affiliates (parents)' is capital per worker of the multinational affiliates (parents). 'FD' is first differencing estimate. 'GMM-AB' is GMM Arellano and Bond estimation. 'GMM-BB' is GMM blunder and bond estimation. Values in parentheses are standard errors. Robust standard errors. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 5: Rent results: additional test

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
$Profit^P$	.012**	.007	.004		.007*	.031***			
	(.005)	(.006)	(.004)		(.003)	(.003)			
$ProfitB^P$				.033***					
				(.004)					
$Capital^P$	.092***	.195***	.002	.088***	.082***		.100***		
	(.011)	(.021)	(.009)	(.009)	(.008)		(.011)		
$Profit^A$	.038***	.027***	.025***	.031***	.011***	.067***			
	(.004)	(.005)	(.003)	(.003)	(.003)	(.002)			
$Capital^A$	.243***	.288***	.244***	.321***	.267***		.317***		
	(.009)	(.015)	(.008)	(.008)	(.008)		(.020)		
$CashFlow^A$					.070***				
					(.004)				
$Intangibles^A$					.010***				
					(.002)				
$Debt^A$					.003				
					(.002)				
$Employees^A$					-.120***				
					(.010)				
Lag.$Profit^P$							.009***		
							(.004)		
Lag.$Profit^A$							.003		
							(.003)		
$Profit^P$(L)								.006**	-.009
								(.002)	(.113)
$Capital^P$(L)								.0002	.004
								(.0001)	(.006)
$Profit^A$(L)								.044***	.023
								(.002)	(.027)
$Capital^A$(L)								.000	.025***
								(.000)	(.005)
Obs.	8054	3983	9803	12032	14342	21840	14401	22965	1125
F statistic	367.376	176.288	251.848	692.014	405.507	495.841	150.175	572.642	13.5
R^2	.927	.926	.957	.941	.942	.928	.952	.93	.981

Notes: Dependent variable: log average wage per worker of multinational affiliates. Explanatory variables (apart from $Profit^P$(L), $Capital^P$(L), $Profit^A$(L) and $Capital^A$(L))are in logs. All Columns include affiliate firm fixed effects and year fixed effects. Column 1 includes only wholly owned affiliates, Column 2 includes only majority owned affiliates, and Column 3 includes only minority owned affiliates. Column 8 include parents who report both positive and negative profits. Column 9 only include parents with negative profits. 'Profit, affiliates (parents)' is profit after taxes per worker of the multinational affiliates (parents). 'Capital, affiliates (parents)' is capital per worker of the multinational affiliates (parents). $ProfitB^P$ is profit before taxes per worker of the multinational parents. '$Debt^A$' is long term debt of the affiliate. '$CashFlow^A$' is the cash flows of the affiliate, '$Intangibles^A$' is intanbiles of the affiliate, '$Employees^A$' is the total number of employees of the affiliate. Lag.$Profit^P$ is one lag of profit per worker of the multinational parents. 'Lag.$Profit^A$' is one lag of profit per worker of the multinational affiliates. Values in parentheses are standard errors. Robust standard errors. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 6: Rent sharing: affiliate profits on parent wages

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
$Profit^A$				.016***	.002	-.0007	.0005	
				(.004)	(.003)	(.002)	(.002)	
$Capital^P$				.003	.006	-.0006	-.004	
				(.006)	(.004)	(.003)	(.004)	
$Profitavg^A$								-.0003
								(.004)
$Capitalavg^A$								-.002
								(.007)
$Profit^P$	.0003	.030***	.035***	-.004	.029***	.035***	.041***	.035***
	(.005)	(.004)	(.004)	(.005)	(.004)	(.004)	(.003)	(.004)
$Capital^P$	.305***	.302***	.343***	.301***	.299***	.343***	.354***	.343***
	(.007)	(.005)	(.008)	(.007)	(.006)	(.008)	(.008)	(.008)
Obs.	12612	12612	12612	12612	12612	12612	12612	12612
F statistic	1693.842	121.773	326.755	896.521	119.195	285.883	311.251	285.869
R^2	.308	.547	.864	.31	.547	.864	.883	.864

Notes: Dependent variable for each regression is wage per worker of multinational parents in all columns. Second and fifth columns above include country, sector and year fixed effects, while third, sixth, seven and eight columns above include a full set of fixed effects, include parent firm fixed effect and year fixed effect. Values in parentheses are standard errors. 'Profit, parents' is profit per worker of the multinational parents. 'Capital, parents' is capital per worker of the multinational parents. Column 7 adds the weight that is inversely proportional to the number of affiliates for each parent. $Profitavg^A$ and $Capitalavg^A$ are the average profits and capital of the affiliates who share the same parent, respectively. 'Profit, affiliates' is profit per worker of the multinational affiliates. 'Capital, affiliates' is capital per worker of the multinational affiliates. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 7: Falsification test: Rent sharing based on 'matched parents'

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
tPanel A: benchmark								
Profit, 'parents'	.019**	.004	-.009	.021**	.004	-.008	-.007	-.004
	(.009)	(.005)	(.007)	(.009)	(.005)	(.007)	(.008)	(.004)
Capital, 'parents'	-.079***	-.025***	-.005	-.079***	-.025***	-.011	-.032	.004
	(.011)	(.007)	(.014)	(.011)	(.007)	(.015)	(.030)	(.006)
Profit, affiliates	.018**	.035***	.037***	.016**	.035***	.037***	.038***	.046***
	(.007)	(.004)	(.005)	(.007)	(.004)	(.005)	(.010)	(.007)
Capital, affiliates	.426***	.205***	.358***	.425***	.204***	.347***	.443***	.430***
	(.010)	(.006)	(.011)	(.010)	(.006)	(.011)	(.078)	(.053)
Obs.	8994	8994	8994	8994	8994	8994	6131	12570
No. Parents	1179	1179	1179	1179	1179	1179	681	681
No. affiliates	2835	2835	2835	2835	2835	2835	1747	1787
F statistic	633.731	52.753	193.646	642.059	51.727	184.758	77.155	168.301
R^2	.357	.766	.927	.352	.764	.925	.898	.896
Panel B: matching also on profits								
Profit, 'parents'	.029***	.016***	-.003	.032***	.017***	-.001	-.007	-.004
	(.009)	(.005)	(.007)	(.009)	(.005)	(.007)	(.008)	(.004)
Capital, 'parents'	-.094***	-.035***	-.001	-.092***	-.034***	-.006	-.032	.004
	(.011)	(.007)	(.015)	(.012)	(.007)	(.015)	(.030)	(.006)
Profit, affiliates	.015**	.035***	.037***	.014**	.035***	.037***	.038***	.046***
	(.007)	(.004)	(.005)	(.007)	(.004)	(.005)	(.010)	(.007)
Capital, affiliates	.428***	.206***	.357***	.427***	.205***	.343***	.443***	.430***
	(.010)	(.006)	(.011)	(.010)	(.006)	(.011)	(.078)	(.053)
Obs.	8964	8964	8964	8964	8964	8964	6131	12570
No. Parents	1188	1188	1188	1188	1188	1188	681	681
No. affiliates	2831	2831	2831	2831	2831	2831	1747	1787
F statistic	623.711	53.323	191.2	636.627	52.268	180.511	77.155	168.301
R^2	.355	.769	.927	.351	.768	.926	.898	.896

Notes: Dependent variable: log of wage per worker in each affiliate. Columns 1-3 impose weights (inverse of the absolute difference in the propensity scores of the true and matched parent). Columns 2 and 5 include country, sector and year effects. Columns 3, 6, 7 and 8 include affiliate firm fixed effects and year fixed effects. 'Profit, affiliates (parents)' is profit per worker of the multinational affiliates (parents). 'Capital, affiliates (parents)' is capital per worker of the multinational affiliates (parents). Column 7 requires each match to be in the same year and the same three digit sector. Column 8 contains matches from three nearest neighbour methods. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 8: Effects of location on rent sharing

	(1)	(2)	(3)	(4)	(5)
$Profit^P * IPR$	.0009				
	(.004)				
$Profit^P * Technology$		-.007			
		(.006)			
$Profit^P * Economic$			-.038***		
			(.004)		
$Profit^P * Taxation$				-.029***	
				(.005)	
$Profit^P * TradeUnion$					.012***
					(.004)
IPR	.119***				
	(.006)				
Technology		.249***			
		(.007)			
Economic			.517***		
			(.006)		
Taxation				.129***	
				(.005)	
TradeUnion					-1.161***
					(.030)
Profit, affiliates	.054***	.038***	.047***	.041***	.055***
	(.004)	(.009)	(.005)	(.006)	(.004)
Capital, affiliates	.387***	.507***	.407***	.479***	.328***
	(.008)	(.010)	(.006)	(.007)	(.008)
Profit, parents	.018***	.018	-.003	.013	.016***
	(.004)	(.012)	(.007)	(.008)	(.004)
Capital, parents	.102***	.069***	.006	-.002	.056***
	(.008)	(.021)	(.014)	(.016)	(.008)
Obs.	21307	12173	21697	21061	20809
F statistic	816.8	1057.403	1340.657	546.014	981.818
R^2	.938	.738	.781	.685	.925

Notes: Dependent variable: log of wage per worker in each affiliate. All firm characteristics variables are in logarithms. Values in parentheses are standard errors. See the notes to Table 1 for more details. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 8 (continued): Effects of location on rent sharing

	(6)	(7)	(8)	(9)	(10)
$Profit^P * SameLang.$	-.037***				
	(.006)				
$Profit^P * Geography$		-.003			
		(.007)			
$Profit^P * SameSector$			-.036***		
			(.006)		
$Profit^P * Affiliates.$				-.011***	
				(.003)	
$Profit^P * EmployeesRatio.$					.013*
					(.007)
Common language	.075***				
	(.006)				
Geographic		-.297***			
		(.013)			
Same sector			-.040***		
			(.007)		
Number of affiliates				.016***	
				(.004)	
Employees ratio(Affiliate/Parent)					-.036**
					(.018)
Profit, affiliates	.042***	.040***	.036***	.068***	.037***
	(.006)	(.006)	(.007)	(.004)	(.006)
Capital, affiliates	.564***	.565***	.595***	.236***	.569***
	(.007)	(.007)	(.008)	(.005)	(.007)
Profit, parents	.028***	.029***	.029***	.023***	.029***
	(.008)	(.008)	(.009)	(.004)	(.008)
Capital, parents	.069***	.075***	.055***	.014***	.066***
	(.015)	(.015)	(.017)	(.005)	(.015)
Obs.	21697	21697	21840	21840	21840
F statistic	1601.562	1689.323	1358.603	558.213	1565.803
R^2	.681	.687	.688	.784	.68

Notes: Dependent variable: log of wage per worker in each affiliate. All specifications control for parent firm fixed effect and year fixed effects. See notes to Table 8 for more details. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 9: Appendix A: Number of firms and key variables per country

	Affiliates				Parents			
Country	**N.**	**Profit**	**Capital**	**Wage**	**N.**	**Profit**	**Capital**	**Wage**
Australia	20	29.43	309.53	24.17	20	36.74	907.51	32.38
Austria	47	16.94	289.34	45.15	28	21.72	257.57	46.78
Belgium	279	32.44	1822.3	56.08	97	23.24	545.01	49.84
Brazil	5	46.38	614.06	6.53	0			
Bulgaria	35	6.03	64.73	4.68	0			
Canada	0				3	94.13	1231.48	
China	15	16.72	215.44	4.75	2	2.28	53.83	
Czech Republic	194	15.55	112.73	11.18	2	16.13	266.2	11.11
Denmark	178	21.82	248.02	45.68	78	21.65	251.09	40.48
Estonia	97	6.79	56.23	8.5	0			
Finland	132	28.96	226.93	43.68	85	20.75	257.06	38.07
France	900	25.1	311.08	49.53	142	31.5	669.78	52.75
Germany	381	31.35	356.98	58.45	154	22.88	257.96	47.7
Greece	2	14.45	189.17	24.83	15	23.51	237.08	34.39
Hong Kong	4	18.36	338.67	9.43	2	15.81	142.52	9.03
Hungary	39	12.98	138.18	16.98	4	16.99	141.38	11.53
Iceland	2	89.11	512.57	52.96	5	5.96	224.85	32.99
India	15	5.69	54.83	4.18	0			
Indonesia	11	8.47	55.54	3.66	0			
Ireland	5	99.97	543.68	37.82	21	32.14	309.38	36.93
Italy	467	27.97	374.96	43.5	112	24.92	374.36	41.92
Japan	13	41.83	304.91	43.38	161	25.77	542.1	40.6
Latvia	5	4.47	61.79	8.74	0			
Liechtenstein	1	4.28	52.7	33.79	1	9.85	120.43	42.58
Lithuania	1	3.39	71.45	5.77	2	0.36	22.19	
Luxembourg	21	26.72	748.2	39.23	10	36.38	1050.83	53.1
Malaysia	23	15.58	142.34	10.06	8	21.48	299.58	8.42
Mexico	0				1	41.55	455.3	
Netherland	201	48.35	697.49	51.52	203	20.28	373.69	45.07
Norway	149	23.76	202.99	46.24	38	45.65	425.59	49.61
Philippines	5	13.67	125.74	4.47	0			
Poland	193	17.09	149.7	11.48	7	17.42	361.04	28.56
Portugal	84	27	261.2	26.42	11	25.67	368.61	24.02
Romania	130	10.15	71.01	5.59	1	0.78	145.57	11.97
Russia	1	23.62	101.4	10.56	5	13.53	86.7	6.17
Singapore	20	11.99	166.86	13.62	15	21.87	363.25	19.4
Slovenia	9	21.56	256.06	24.75	2	12.14	97.83	14.77
South Africa	6	10.55	83.55	10.25	8	11.48	185.8	27.37
South Korea	33	47.55	292.95	15.54	2	58.67	304.97	
Spain	249	34.05	377.97	42.05	66	44.14	501.96	39.21
Sweden	208	26.53	293.03	29.75	144	22.08	252.44	138.79
Switzerland	20	30.42	332.28	49.42	70	19.7	226.33	39.84
Taiwan	16	24.62	197.4	13.84	10	12.68	357.12	14.95
Thailand	30	11.97	125.96	4.99	2	7.2	135.46	3.72
Turkey	0				3	48.57	263.8	5.44
UK	984	25.62	344.52	38.27	182	22.52	331.8	41.37
US	0				457	24.38	243.27	

Notes: 2,179 multinational parents and 5,230 overseas affiliates. 'Profit' ('Capital', 'Wage') refers to average profits (capital, wages) per worker. All monetary variables in thousands of euros.

Table 10: Appendix B: Rent sharing - weights based on parent or host country FDI

	(1)	(2)	(3)	(4)	(5)	(6)
Weights based on host country FDI						
Profit, parents				.040***	.023***	.011***
				(.006)	(.003)	(.003)
Capital, parents				-.060***	.026***	.120***
				(.008)	(.004)	(.007)
Profit, affiliates	.026***	.045***	.035***	.022***	.042***	.033***
	(.005)	(.002)	(.002)	(.005)	(.002)	(.002)
Capital, affiliates	.380***	.167***	.302***	.391***	.155***	.281***
	(.009)	(.004)	(.006)	(.010)	(.004)	(.006)
Obs.	21809	21809	21809	21809	21809	21809
F statistic	1496.661	141.465	2015.893	769.95	142.326	1122.261
R^2	.328	.75	.929	.332	.753	.93
Weights based on parent country FDI						
Profit, parents				.026***	.016***	.014***
				(.005)	(.003)	(.003)
Capital, parents				-.047***	.019***	.091***
				(.007)	(.004)	(.006)
Profit, affiliates	.026***	.036***	.030***	.023***	.033***	.029***
	(.004)	(.002)	(.002)	(.004)	(.002)	(.002)
Capital, affiliates	.330***	.172***	.280***	.341***	.163***	.264***
	(.006)	(.003)	(.005)	(.007)	(.003)	(.005)
Obs.	21756	21756	21756	21756	21756	21756
F statistic	2429.61	148.253	1962.027	1237.335	147.467	1085.128
R^2	.311	.73	.929	.314	.731	.93

Notes: Dependent variable: log average wage per worker of multinational affiliate. Columns 2 and 5 above include country, sector and year fixed effects. Columns 3 and 6 above include affiliate firm fixed effects and year fixed effects. 'Profit, affiliates (parents)' is profit per worker of the multinational affiliates (parents). 'Capital, affiliates (parents)' is capital per worker of the multinational affiliates (parents). Values in parentheses are standard errors. Significance levels: *: 0.10; **: 0.05; ***: 0.01.

Table 11: Appendix C: Descriptive statistics - quality of parent matches

Variables	Obs	Mean	Std. Dev.
Panel A: benchmark			
Employees difference	1448	-0.022	1.045
Capital (per worker) difference	1448	-0.005	0.936
Profit (per worker) difference	1448	-0.014	1.109
Sales difference	1448	-0.024	1.064
Age difference	1442	0.007	1.026
Subsidiary difference	1448	-0.021	0.589
Same sector	1448	1.000	0.000
Same country	1448	1.000	0.000
Same year	1448	0.335	0.472
Probability difference	1448	-0.001	0.028
Panel B: matching also on profits			
Employees difference	1446	-0.023	1.048
Capital (per worker) difference	1446	-0.004	0.940
Profit (per worker) difference	1446	-0.014	1.106
Sales difference	1446	-0.023	1.065
Age difference	1440	0.010	1.038
Subsidiary difference	1446	-0.020	0.590
Same sector	1446	1.000	0.000
Same country	1446	1.000	0.000
Same year	1446	0.344	0.475
Probability difference	1446	-0.001	0.028

Notes: The 'difference' variables are measured in terms of a rate, defined as the ratio between 1) the difference between the value of the variable for the original parent and the matched parent, and 2) the mean of the two values. These ratios are therefore bound between -2 and +2. The 'same' variables (sector, country, year) are dummies equal to one if the variable takes the same value in the original and matched parents. 'Probability difference' corresponds to the difference between the probabilities of being an affiliate of the original and matched parents.